Important Advances in Clinical Medicine

Epitomes of Progress -- Preventive Medicine and Public Health

The Scientific Board of the California Medical Association presents the following inventory of items of progress in Preventive Medicine and Public Health. Each item, in the judgment of a panel of knowledgeable physicians, has recently become reasonably firmly established, both as to scientific fact and important clinical significance. The items are presented in simple epitome and an authoritative reference, both to the item itself and to the subject as a whole is generally given for those who may be unfamiliar with a particular item. The purpose is to assist the busy practitioner, student, research worker or scholar to stay abreast of these items of progress in Preventive Medicine and Public Health which have recently achieved a substantial degree of authoritative acceptance, whether in his own field of special interest or another.

The items of progress listed below were selected by the Advisory Panel to the Section on Preventive Medicine and Public Health of the California Medical Association and the summaries were prepared under its direction.

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Rabies

Treatment of rabies begins with emergency care of the bite. If the skin is not broken, no treatment is indicated. The wound should be irrigated thoroughly with 20 percent soap solution or some other antiseptic. It must be verified that the biting animal is rabid, if possible. Of all identified rabid animals, approximately 75 percent are wild animals. Records of the California State Department of Public Health, over an 18-year period and 25,000 examinations, show that gophers, mice, hamsters, squirrels, and similar animals have not had one case of rabies. Biting animals which can spread rabies should be confined for 10 days to see if they show symptoms of the disease. Carriers of rabies, such as bats, should have their brain tissue examined immediately.

Persons with severe bites, especially on the head, should be given antirabies serum and vaccine unless the biting animal has a current rabies vaccination. Serum should be given in a single dose—40 International Units (IU) per kilogram of body weight. At the same time, DEV or Semple vaccine should be started. Daily injections should be continued for 14 to 21 days if the animal is proved to be rabid. Reactions to DEV

vaccine are less likely to occur unless the recipient is allergic to feathers or eggs. Semple vaccine is more likely to cause adverse reactions. If it does, preventive treatment should immediately be changed to DEV. One or two human deaths a year continue to occur in the United States due to lack of preventive treatment, but deaths can occur due to reaction to antirabies vaccine. It is imperative that a careful investigation as to the condition and history of the biting animal can be made before treatment is begun.

Local health departments should be consulted concerning animal bite problems. All animal bites are reportable to it or the agency which confines animals for observation. Animal brain tissue can be examined for rabies in the local public health laboratory or California State Department of Public Health, Virus Laboratory. If antirabies serum or vaccine is needed, the local health department can assist in getting it. Consultation in any diagnostic or treatment problem is also available.

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REFERENCES

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Humphrey GL: California State Department of Public Health, memorandum, May 10, 1971

Girard KF, Hitchcock HB, Edsall G, et al: Rabies in bats in southern New England, N Engl J Med 272:75-80, Jan 14, 1965

Methyl Mercury

The existence of environmental mercury contamination became evident only after the recent discovery of "Minimata disease" in Japan. One hundred and sixty-eight cases of severe neurological disease occurred, with 52 deaths and 23 congenitally brain-damaged infants, were reported in some 400 live births. The elusive cause was finally determined to be the consumption of fish and shellfish contaminated with mercury discharged from chemical plants. Industrial mercury discharges, previously thought to be inert, are methylated by microbial systems in the bottom sediment of fresh and salt water. The methyl mercury thus formed enters the aquatic food chain and undergoes tremendous concentration as it ascends this pathway from smaller to larger species.

The mercury in fish is virtually all in the form of alkyl (methyl) mercury which is many times more toxic than metallic, inorganic or aryl forms of mercury. Inorganic and alkyl mercury poisoning are manifested as two distinct symptom complexes, although some overlapping may exist in heavily exposed cases. They appear to be separate clinical entities showing marked differences in absorption, excretion, specific tissue localization, transplacental migration, pathological picture, occurrence of chromosome damage and reversibility of symptoms.

A second source of alkyl mercury contamination is the use of agricultural fungicides applied to seed grain. This practice has been responsible for several tragic epidemics (Iraq, Pakistan and Guatamala) and the celebrated case of the Huckelby family in New Mexico. It has also caused serious contamination of seed-eating birds, including pheasant in California. In addition, methyl mercury undergoes translocation into the grain grown from the treated seed, thus contributing to wide-spread, if low-level, human and animal exposure to this cumulative toxin. In 1970 almost all seed grain planted in California was treated with alkyl mercury. By the end of 1972, this practice is scheduled to be eliminated.

The FDA "guideline" level of 0.5 ppm for mercury in fish has been critically examined in many quarters and appears to be on a sound basis, although the margin of safety is not large. Pregnant women carry an increased risk, and there is evidence that some persons may be hyper-susceptible to mercury. However, in this country there has been only one reported case of illness attributed to eating mercury-contaminated fish. On the basis of present knowledge it would be unfortunate if public over-reaction